

chaetae. He states that the chaetae surrounding the end of the body measured 6 mm. in length and are "blässgelb" in colour; the dorsal bundle of chaetae has rarely more than four (which is true when examined under a lens only); there is but a single ventral hook, the figure of which, crude as it is, is sufficiently like that of the present species. The few details that he gives, then, might well refer to our specimens. There is, however, one in which it appears to differ. Schmarda says that the dorsal chaetae are thicker than those of the cephalic crown, and have a greater number of transverse striations, since these are closer together in the former than in the latter. His figure shows no such difference in size, but his account of the striations agrees with what I find.

On the grounds, then, of probability, and of agreement in the general structure, it seems to me we must revive Schmarda's specific name for our common Chlorhaemid.\*

ART. XXI.—*Preliminary Report on the Polychaetous Annelids from the Kermadec Islands.*

By W. B. BENHAM, D.Sc., F.R.S.

[Read before the Otago Institute, 8th July, 1914.]

ALTHOUGH a few deep-water Annelids were obtained by the "Challenger" in the neighbourhood of the Kermadec Group, no littoral forms have hitherto been recorded. Mr. Oliver's collection contains nineteen species belonging to thirteen genera, none of which agree with the species described by McIntosh in the "Report of the 'Challenger' Expedition."

Of these nineteen, only two species occur on the seashores of New Zealand—viz., *Odontosyllis picta* and *Flabelligera bicolor*. Two others have hitherto been found only in the Australian waters—namely, *Lepidonotus simplicipes* and *Amphinome nitida*. Five are widely distributed throughout the Indo-Pacific oceans—*Eunice aphroditois*, *Lysidice collaris*, *Eurythoe complanata*, *Phyllodoce macrolepidota*, and *Lepidonotus glaucus*. There are two others with even a wider distribution—namely, *Eunice siciliensis*, which occurs in the Mediterranean as well as in the Indo-Pacific area; and *Hippunoe gaudichaudi*, originally obtained from the coast of Australia, has been met with as far away as the eastern coast of America. It is a rare species, and there are only three other records since its discovery.

I have found it necessary to found eight new species and one new variety, all of which, however, are more or less closely allied to Indo-Pacific forms.

I have not yet had the time to finish the drawings in illustration of these new species, so that in this preliminary note I refrain from naming them: for I hope to publish a detailed account of this interesting collection elsewhere, with full synonymy and references to literature.

\* I had hoped that before this article was published I should have been able to convince Professor Ehlers of the justice of my conclusion, and while preparing the manuscript I posted a packet, containing samples from various localities, to Ehlers, and a letter asking him to compare them with the types of his two species. Unfortunately, war was declared before the packages reached England, and they were returned to me as "undeliverable."

## LIST OF THE SPECIES.

## Fam. AMPHINOMIDAE.

**Amphinome nitida** Haswell, 1879.

*Locality.*—Sunday Island : (a.) In husk of coconut cast ashore on Denham Bay beach, 25/6/08 (Oliver), thirteen individuals, of which Oliver writes : "Colour is slate, lighter below ; bristles white ; gills slate, tips reddish-brown." (b.) One specimen (R. S. Bell).

*Distribution.*—Cape Grenville, Queensland (Haswell).

It seems to be closely allied to, if not identical with, *A. jukesi* Baird, 1868.

**Eurythoe complanata** Pallas, 1766.

*Locality.*—(a.) Coral Bay, Sunday Island, one. (b.) Meyer Island, in rock-pools, three (2/2/08 and 19/5/08). Oliver states that it is "delicate pinkish white."

*Distribution.*—Very wide, in tropical and sub-tropical seas, where coral reefs occur. Indo-Pacific ; West Indies ; also Mediterranean.

**Hipponoe gaudichaudi** Audouin and Milne-Edwards, 1830.

*Locality.*—Sunday Island : "Cast up on Denham Bay beach, 19/10/08." Three individuals.\*

*Distribution.*—Port Jackson (type) ; north of Bermuda ; also in north Pacific ("Challenger") ; at Woods' Hole, Massachusetts (Moore, 1903).

## Fam. APHRODITIDAE.

**Lepidonotus glaucus** Peters, 1854.†

*Locality.*—Coral Bay, Sunday Island (Oliver) ; one female and one male (R. S. Bell).

*Distribution.*—Red Sea ; Philippines ; Ceylon ; Samoa ; Fiji ; Maldives ; Zanzibar.

**Lepidonotus simplicipes** Haswell, 1883.

*Locality.*—(a.) Coral Bay, Sunday Island (Oliver), eight. (b.) Sunday Island (R. S. Bell), five. (c.) Meyer Island (Oliver), five, "under stones amongst gravel."

*Distribution.*—Griffith's Point, Western Port, Australia (Haswell).

**Sigalion** sp. nov. ; affin. *S. amboinensis* Grube, 1877.

*Locality.*—Denham Bay, Sunday Island, "dredged in 20 fathoms, on sandy bottom, 5/2/08" (Oliver) ; a single individual.

## Fam. PHYLLODOCIDAE.

**Phyllodoce macrolepidota** Schmarda, 1861.

*Locality.*—Crater Rocks, Sunday Island (Oliver) ; "under stones near low water, 25/7/08." He notes that it is "green in life."

*Distribution.*—Philippines (Grube) ; Ceylon (Schmarda), (Wiley).

**Phyllodoce** sp. nov. ; affin. *P. foliosopapillata* Hornell, 1903.

*Locality.*—Meyer Island ; one specimen.

\* See "Addendum" on p. 173.

† Ehlers (Z. Kenntniss d. Ostafrikan. Borstenw., 1897) has established the identity of the well-known *L. trissochaetus* Grube, 1869, with Peters's species.

## Fam. SYLLIDAE.

*Odontosyllis picta* (Ehlers, 1904). *Eurymedusa picta* Ehlers.

This species does not belong to Kinberg's genus *Eurymedusa*, as Ehlers supposed; he compared it with the type, but the state of preservation of that did not allow him to study the protruded pharynx. An examination of duplicates of the specimen which I sent to Ehlers shows quite clearly the row of denticles characteristic of *Odontosyllis*.\*

Whether the specimen received by him from Schauinsland from Laysan is identical with our New Zealand species, of course I cannot say.

*Locality*.—Meyer Island, "amongst coralline algae, 24/4/08" (Oliver).

*Distribution*.—New Zealand (Ehlers).

## Fam. LYCORIDAE.

*Nereis* sp. nov. (A); affin. *N. melanocephala* McIntosh, 1885.

*Locality*.—Sunday Island, Denham Bay beach; "washed ashore in husk of coconut, with *A. nitida*, 25/6/08"; three specimens.

*Nereis* sp. nov. (B); affin. *N. tongatabuensis* McIntosh, 1885.

*Locality*.—Meyer Island; "amongst coralline algae, 24/4/08"; four individuals in the "atokous" and two in the "epitokous" stage.

*Nereis* sp. nov. (C); affin. *N. masalacensis* Grube, 1878.

*Locality*.—Coral Bay, Sunday Island; five specimens.

## Fam. EUNICIDAE.

*Eunice aphroditois* Pallas, 1788.

*Locality*.—Sunday Island (R. S. Bell). A fragment consisting of head and 40 segments.

*Distribution*.—Red Sea; Ceylon; Fiji; Philippines; Cape of Good Hope; Australia.

For synonymy see my report on the Annelids in "Scientific Results of the New Zealand Government Trawling Expedition" in "Records Canterbury Museum," vol. 1, No. 2, 1909.

*Eunice siciliensis* Grube, 1840.

*Locality*.—(a.) Coral Bay, Sunday Island; three specimens. (b.) Denham Bay beach; one. (c.) Meyer Island; one.

*Distribution*.—Mediterranean; Red Sea; East Africa; Seychelles; Maldives; Ceylon; Philippines; Juan Fernandez.

*Eunice* sp. nov.; affin. *E. medicina* Moore, 1903.

*Locality*.—Coral Bay, Sunday Island; three specimens.

*Paramarphysa* sp. nov.; affin. *P. longula* Ehlers, 1887.

*Locality*.—Sunday Island, Coral Bay; a fragment.

*Lysidice collaris* Grube, 1878. Var. *kermadecensis* var. nov.

*Locality*.—Coral Bay, Sunday Island; two complete individuals and four cephalic fragments; it is "green in life."

*Distribution*.—Red Sea; Ceylon; Philippines; Japan; Zanzibar.

*Aracoda* sp. nov.

*Locality*.—Coral Bay, Sunday Island; one specimen.

\* See article by myself in this volume (*ante*, p. 161).

## Fam. CHLORHAEMIDAE.

*Flabelligera bicolor* Schmarda, 1861. (*F. lingulata* Ehlers and *F. semiannulata* Ehlers, 1904.)

*Locality.*—(a.) Coral Bay, Sunday Island; six specimens. (b.) Denham Bay, Sunday Island; one. (c.) Meyer Island, rock-pools; two.

*Distribution.*—New Zealand (Ehlers).

I have re-examined duplicates of those which I sent to Professor Ehlers, and have arrived at the conclusion that his two species are identical, but the individuals which he had at his disposal were in different states of preservation. I have written to him, and have received a reply in which he allows me, as having had abundant material to compare, to unite them. In my opinion Ehlers' name must give way to Schmarda's, who found only one species of *Flabelligera*, and as I have received specimens from the same locality as he found it—namely, Auckland Harbour—it is practically certain, in spite of the imperfect account given by him, that we are dealing with Schmarda's species, for I have received from all parts of our coasts only the one species of *Flabelligera*.\*

## ADDENDUM.

NOTE ON THE YOUNG OF *HIPPONOE GAUDICHAUDI*.

After writing the above summary I received from Dr. Chilton five small specimens of *Hipponoe gaudichaudi* which had been found by Mr. L. S. Jennings within the mantle-cavity of *Lepas anatifera*, from the Kermadec Islands. The worm has previously been found in association with barnacles. Thus Baird† (1868) refers to specimens then in the British Museum as having been found "amongst barnacles on a log of timber (? Madeira)," and to others from the neighbourhood of St. Helena as having been "concealed in the valves of *Lepas fascicularis*." McIntosh, also, in the "Challenger" Report (1885) records an individual "found adherent to *Lepas fascicularis* on the surface of North Pacific"; and Moore‡ (1903) found specimens on the under-surface of a log covered with *Lepas anatifera* which came ashore at Vineyard Sound, Woods' Hole. The worm, then, appears to have always been found on floating objects, to which they cling evidently by means of their powerful ventral hooks.

The interest of the present small specimens, which measure from 7 mm. to 14 mm. in length, lies in the fact that on most of them I noted some small brown bodies behind the dorsal chaetae, which I at first took for the gills filled with blood, till on touching them they fell away, and were then seen to be small annelids. They are a little more or a little less than 1 mm. in length by about 0.4 mm. across the middle part of the body, tapering to a blunt rounded end anteriorly and posteriorly. These spindle-shaped annelids are the young *Hipponoe*, which evidently cling to the body of the parent, and possibly wander over the body, for I found them sometimes between the bristles and the gill, more usually just behind the latter in the intersegmental furrow, sometimes more dorsally than the chaetae, at others rather more laterally; usually a single one at any spot, occasionally a couple together.

\* See article by myself in this volume (*ante*, p. 163).

† Baird, Linn. Soc. Journ., x, 1868, p. 239.

‡ Moore, Proc. Acad. Nat. Sci. Philadelphia, 1903, p. 793.

The young one consists of a rounded prostomium, followed by 6 chaetigerous segments, and a rounded anal segment, which is nearly as large as the prostomium.

The mouth lies between this and the 1st segment, which is not ventrally perforated by it as in the adult. The 1st segment bears only the dorsal bristles; the rest have the ventral hooks in addition. The dorsal chaetae, as in the adult, are long capilliforms, 3-6 in a bundle; the four ventral hooks, which are precisely like those of the adult, are sunk in a pit, but are capable of being protruded, as a slight pressure on these soft-bodied young ones readily demonstrates.

There are no gills, and the dorsal cirrus is at present represented by only a small spherical bladder-like structure just behind the ventral limit of the dorsal bundle of bristles.

It may be noted that Baird records that amongst his specimens several had "attached to their under-surface animals which are doubtless parasitic on them." It seems, however, to be likely that he had before him the young ones.

It is perhaps remarkable that all those *Hippoonoe gaudichaudi* that have been examined microscopically have proved to be females. I found that to be the case; McIntosh and Moore both described their specimens as being distended with eggs. It seems, then, that the male is yet to be discovered, and no doubt the worm would repay anatomical study if we could get well-preserved material.

#### ART. XXII.—*Oligochaeta from the Kermadec Islands.*

By W. B. BENHAM, D.Sc., F.R.S.

[Read before the Otago Institute, 7th July, 1914.]

THE only species of earthworm hitherto recorded from the Kermadecs is *Rhododrilus kermadecensis*, described by myself\* in 1904, and this species was founded on a single specimen collected by Captain Bollons. It was therefore with feelings of interest that I received from Mr. Oliver a considerable number of earthworms which I expected would afford further material for determining the faunistic relations of the group of islands. Some of the smaller worms appeared on a first inspection to agree in general size and colour with *Rhododrilus*, and, owing to various calls on my time, I set the tubes aside till I was at liberty to examine them thoroughly. When, however, I came to investigate them it was with great disappointment that I found that all the earthworms belong to the family *Lumbricidae*, characteristic of the Northern Hemisphere, and to species which have been widely disseminated by human agency. This is the more surprising as but little cultivation has been carried on, for the only inhabitants have been Mr. Bell and his family. But while it is certain that these Lumbricids have been introduced, the exact means by which this introduction has been effected is not in all cases evident. It may be that the cocoons were amongst seeds imported for grass or vegetables or other plants, or perhaps they were in the material used for packing, or, if living plants have been imported into the Kermadecs from New Zealand with a fair amount of soil at the roots,

\* Trans. N.Z. Inst., vol. 37, p. 298.